

Availability of Low-Sulfur Marine Distillates to Fuel Oceangoing Vessel Auxiliary Engines in California Coastal Waters

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Sacramento, California

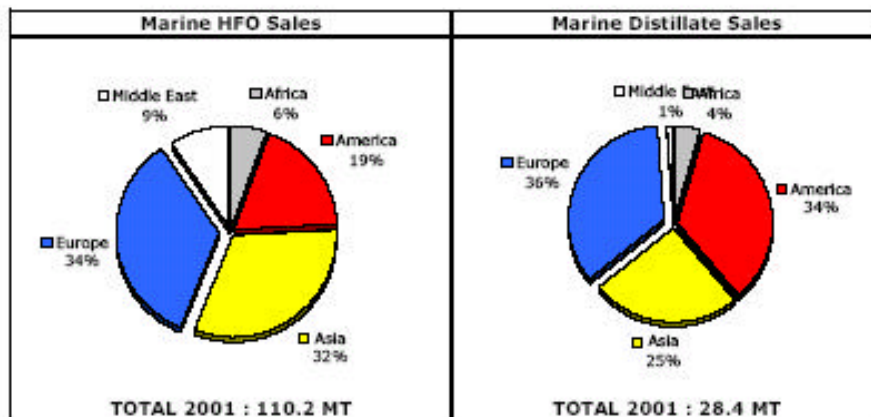


California Environmental Protection Agency



Air Resources Board

Marine Fuel Sales in Regions of the World



Source: Beicip Franlab, 2003

Where Do OGVs that Operate in California Waters Currently Refuel?

U.S. Port Locations

- POLB
- POLA
- Puget Sound
- Oakland
- Benicia
- San Diego
- San Francisco



International Locations

- Netherlands (Rotterdam)
- Singapore
- Japan (Shimzu, Tokyo, Osaka, Nagoya, Moji, Hakata, and Kobe)
- Hong Kong
- Taiwan (Kaohsiung)
- China (Shanghai)

What are the Proposed Fuel Requirements of the Draft Rule?

- ♦ For oceangoing vessels
 - no one shall operate in California waters an auxiliary engine, unless it uses low-sulfur marine distillates (MGO or MDO)
 - Beginning July 1, 2006: 0.2% sulfur
 - Beginning January 1, 2010: 0.1% sulfur
- ♦ MGO is DMA or DMX as defined in Table 1 of ISO 8217
- ♦ MDO is DMB as defined in Table 1 of ISO 8217

How Much Low-Sulfur Marine Distillate will be Required to Meet the Increased Demand?

Current Staff Estimate:

- ♦ Berthing: 22 million gallons per year
- ♦ Transit: 17 million gallons per year
- ♦ Total: 39 million gallons per year of low-sulfur marine distillate (930 thousand barrels per year or 130,000 tonnes per year)



How Much Marine Distillate is Currently Available in Different Parts of the World?

	Estimated Number of Barrels of Marine Distillate Available (<u>thousands/year</u>)
Europe	76,000
Asia	53,000
California and Washington	<u>2,900</u>
Total:	131,900

930
(< 1% of total)



Estimated Volume of
Low-Sulfur Marine
Distillate Required by
Rule

So Assuming There is Enough Marine Distillate Available - What is the Current Sulfur Content (weight %) of Marine Distillate?

Marine Distillate			
Average Sulfur Content			
	DMA	DMX	DMB
Europe			
Netherlands	0.30	N/A	1.02
Asia			
Singapore	0.53	N/A	0.53
Japan	0.12	N/A	0.77
Hong Kong	0.39	N/A	0.42
Korea	0.81	N/A	0.87
China	0.29	N/A	0.32
California			
United States	0.23	0.05	0.68

Source: DNVPS, 2003

Oceangoing Ship Survey

Average Sulfur Content of Marine Distillates in Aux. Engines

0.57 (weight %)

Range from 0.05 to 1.5

MGO Sulfur Standards (weight %)

	ASTM	CIMAC	ISO
DMA	1.5	1.5	1.5
DMX	1.0	1.0	1.0
DMB	2.0	2.0	2.0

Will there be Enough Low-Sulfur Marine Distillate Available to Comply with Draft Rule?

- ◆ Need more information
- ◆ Volumes at specific ports market driven
 - Refineries will supply where sufficient demand warrants delivery and storage
 - Estimated demand of low-sulfur marine distillate fuel is <1% of total demand
 - Demand for low sulfur distillates in other sectors near ports (on-road diesel fuel, heating oil) is a factor that would effect availability at ports

Next Steps



- ♦ Further Evaluate Impact of a Low-Sulfur Marine Distillate Requirement on Ship Fuel Storage Capability
- ♦ Fuel Sulfur Content Benefit Analysis
 - Cost
 - Emissions
 - Health Impact
- ♦ Improve Bunkering Port and Marine Distillate Fuel Inventory

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